

WHAT IS CLAIMED IS:

- 1 1. A method of monitoring patterns which are
2 applied to a running web of wrapping material for
3 smokers' products by a cyclically operated paster,
4 comprising the steps of:
5 making discrete images of successive patterns
6 on the running web;
7 forming a composite image of the images of at
8 least some of the patterns applied during a cycle of the
9 paster; and
10 depicting the composite image.

1 2. A method of optimizing patterns which are
2 applied to a running web of wrapping material for
3 smokers' products by a cyclically operated paster,
4 comprising the steps of:
5 making discrete images of successive patterns
6 on the running web;
7 forming a composite image of the images of at
8 least some of the patterns applied during a cycle of the
9 paster;
10 comparing the composite image with a reference
11 image; and
12 initiating changes of the discrete patterns when
13 the comparing step indicates a departure of composite
14 image from the reference image.

1 3. The method of claim 2, wherein said pattern
2 applying step includes advancing the web from the paster
3 at a variable angle and said initiating step includes
4 changing said angle when the composite image departs from
5 the reference image.

1 4. The method of claim 3, further comprising
2 the steps of comparing the composite image with at least
3 one additional reference image which is indicative of
4 a departure of said angle from an optimal angle in a
5 first direction, and changing said angle in a second
6 direction counter to said first direction when the
7 composite image departs from the at least one additional
8 reference image in said first direction.

1 5. The method of claim 3, further comprising
2 the steps of comparing the composite image with a first
3 additional reference image which is indicative of a
4 departure of said angle from an optimal angle in a first
5 direction, comparing the composite image with a second
6 additional reference image which is indicative of a
7 departure of said angle from said optimal angle in a
8 second direction counter to said first direction, incre-
9 asing said angle when the composite image departs from
10 said reference image in a direction toward said first
11 additional reference image, and reducing said angle when
12 the composite image departs from the reference image in
13 a direction toward said second additional reference
14 image.

1 6. The method of claim 5, wherein the departure
2 in said first direction is indicative of an angle smaller
3 than the angle when the composite image matches said
4 reference image and the departure in said second
5 direction is indicative of an angle greater than the
6 angle when the composite image matches said reference
7 image.

1 7. Apparatus for monitoring patterns which are
2 applied to a running web of wrapping material for smo-
3 kers' products, comprising:
4 an associated paster arranged to cyclically apply
5 adhesive patterns to successive sections of the running
6 web;
7 a camera arranged to make pictures of successive
8 groups of patterns;
9 means for evaluating said pictures, including
10 means for making composite images of patterns applied
11 to the running web during a portion at least of each
12 cycle of said paster;; and
13 means for displaying said images.

1 8. The apparatus of claim 7, further comprising
2 first signal generating means arranged to furnish to said
3 camera a series of first signals at a first frequency,
4 said first signals denoting the rate of application of
5 patterns by said paster, and second signal generating
6 means arranged to transmit to said camera a series of
7 second signals at a second frequency higher than said
8 first frequency, said evaluating means being operatively
9 connected with said camera and said camera being arranged
10 to make a picture substantially in response to each
11 second signal and to transmit the picture to said
12 evaluating means, said evaluating means being arranged
13 to make an image from at least some of the pictures trans-
14 mitted thereto between successive first signals

1 9. The apparatus of claim 8, wherein said paster
2 comprises a paste applicator including one of a rotary
3 valve and a rotary roller, said first signal generating
4 means being operatively connected with said paste appli-
5 cator in such a way that the latter generates a first
6 signal at the start of each full revolution of said paste
7 applicator.

1 10. The apparatus of claim 7, wherein said
2 camera is a linear scanning camera arranged to make
3 linear pictures of the patterns on the web.

1 11. The apparatus of claim 7, further comprising
2 a source of linear radiation arranged to direct radiation
3 upon those successive patterns of the web which are
4 imaged by said camera, said camera having an objective
5 oriented substantially at a glancing angle to the plane
6 of the pattern being imaged by the camera.

1 12. The apparatus of claim 7, further comprising
2 means for advancing the web in a predetermined direction
3 along a predetermined path, means for severing the web
4 downstream of said paster - as seen in said direction -
5 at a variable frequency to subdivide the web into a se-
6 ries of uniting bands, means for generating signals at
7 a frequency corresponding to the frequency at which the
8 web is severed by said severing means, and means for ge-
9 nerating and integrating into the composite images infor-
10 mation derived from the frequency of said signals, said
11 information uncluding control markers denoting the cuts
12 made in the web by said severing means.

1 13. The apparatus of claim 7, further comprising
2 first signal generating means arranged to furnish to said
3 camera a series of first signals at a first frequency,
4 said first signals denoting the rate of application of
5 patterns by said paster, second signal generating means
6 arranged to transmit to said camera a series of second
7 signals at a second frequency higher than said first fre-
8 quency, said evaluating means being operatively connected
9 with said camera and said camera being arranged to make
10 a picture substantially in response to each second signal
11 and to transmit the picture to said evaluating means,
12 said evaluating means being arranged to make an image
13 from at least some of the pictures transmitted thereto
14 between successive first signals and further comprising
15 means for advancing the web in a predetermined direction
16 along a predetermined path, means for severing the web
17 downstream of said paster - as seen in said direction -
18 at a variable frequency to subdivide the web into a
19 series of uniting bands, means for generating third
20 signals at a frequency corresponding to the frequency
21 at which the web is severed by said severing means, and
22 means for generating and integrating into the composite
23 images information derived from the frequency of said
24 third signals, said information including control markers
25 denoting the cuts made in the web by said severing means.

1 14. Apparatus for optimizing adhesive patterns
2 which are applied seriatim to a running web of wrapping
3 material for smokers' products by a cyclically operated
4 paster, comprising:

5 a camera arranged to make pictures of successive
6 series of patterns, each of said series including at
7 least some patterns applied during a cycle of the paster;

8 means for evaluating said pictures and for
9 producing images of pictures of said successive series
10 of patterns; and

11 means for storing a reference image, said evalu-
12 ating means including means for comparing said images
13 of patterns with said reference image and means for
14 altering the patterns being applied to the web by said
15 paster when the images of said patterns depart from said
16 reference image.

1 15. The apparatus of claim 14, further
2 comprising means for advancing the web in a predetermined
3 direction and along a predetermined path extending past
4 said paster and thereupon past said camera, said altering
5 means comprising an adjustable deflecting roller engaging
6 the web downstream of said paster and upstream of said
7 camera, as seen in said direction.

1 16. The apparatus of claim 15, wherein said
2 paster includes a portion which cooperates with said
3 roller to change the orientation of successive increments
4 of the web in response to adjustments of said roller and
5 to thus change the patterns being applied to the web by
6 said paster.

1 17. The apparatus of claim 14, wherein said
2 storing means is arranged to further store at least one
3 additional reference image indicative of a departure of
4 the images of said patterns from said first mentioned
5 reference image in at least one of two directions, said
6 evaluating means further comprising means for comparing
7 said images of patterns with said at least one additional
8 reference image and said altering means being further

9 arranged to alter said patterns when the images of said
10 patterns depart from said additional reference image.

1 18. The apparatus of claim 17, wherein said
2 altering means is arranged to change the orientation of
3 the web upstream of said camera in one direction when
4 the images of said patterns depart from said additional
5 reference image in another direction counter to said one
6 direction.

1 19. The apparatus of claim 14, wherein said
2 storing means is arranged to further store first and
3 second additional reference images respectively indicat-
4 ing departues of the images of said patterns from said
5 first mentioned reference image in a first direction and
6 a second direction counter to said first direction, said
7 evaluating means further including means for comparing
8 said images of said patterns with said additional refer-
9 ence images and said altering means being arranged to
10 alter the patterns being applied to the web when the
11 images of said patterns depart from said additional re-
12 ference images.

1 20. The apparatus of claim 19, wherein said al-
2 tering means includes means for changing the orientation
3 of the web between said paster and said camera in one
4 direction when the images of patterns being applied to
5 the web depart from one of said additional reference
6 images and for changing the orientation of the web
7 between said paster and said camera in another direction
8 counter to said one direction when the images of patterns
9 being applied to the web depart from the other of said
10 additional reference images.